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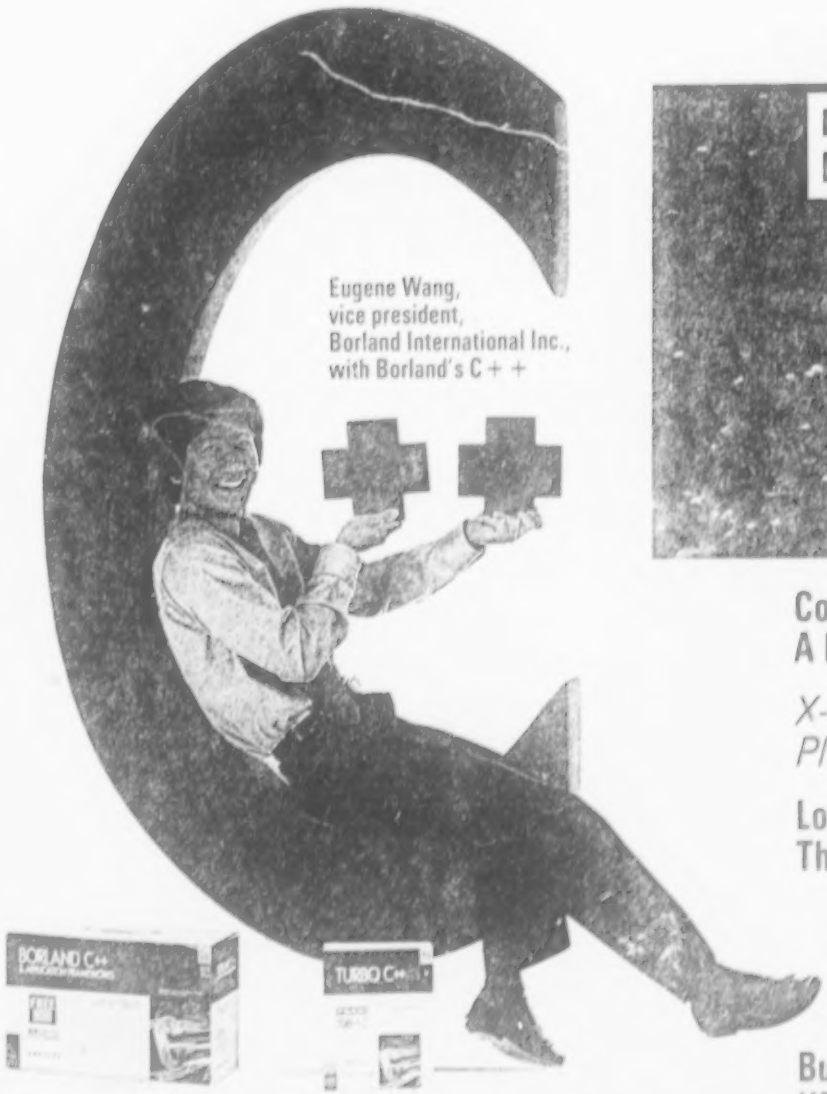
A CAHNERS PUBLICATION

DATAMATION

FOR CORPORATE COMPUTING PROFESSIONALS WORLDWIDE

JANUARY 1, 1992



Eugene Wang, vice president, Borland International Inc., with Borland's C++

Borland's Bridge To OOP

page 22

Compaq's New CEO: A Focus On Price page 37

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CAD Software

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VOLUME 38
NUMBER 1

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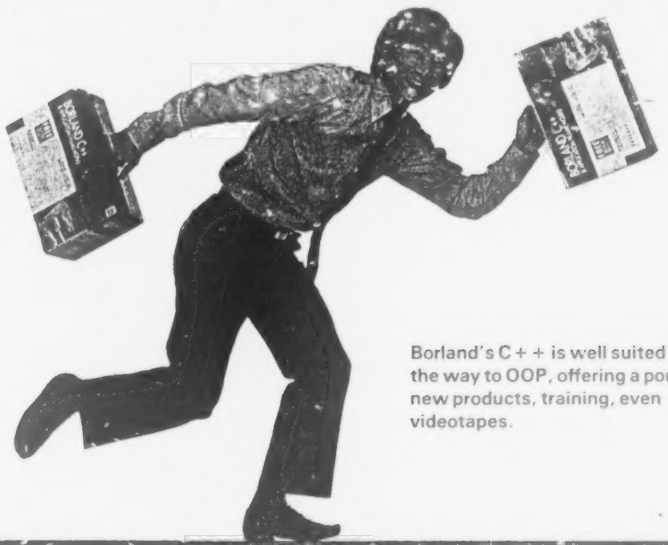

Borland's C++ is well suited to easing the way to OOP, offering a portfolio of new products, training, even videotapes.

COVER STORY

OBJECT-ORIENTED LANGUAGES

Borland's Bridge To OOP 22

BY LEE THÉ Object-oriented technology promises greater programmer productivity and slashed maintenance costs. But for some procedural programmers, it's a bear to master. Borland's latest C++ bridges the OOP and procedural worlds by combining the advantages of each.

Cover photography by Brian Drake

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BY DATAMATION STAFF

IS departments will run lean and mean in the coming year; their attention focused sharply on making the corporation more competitive.

PRODUCT GUIDE

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Apple Resets The Mac 65

BY ELIZABETH LINDHOLM

A muscular processor, a souped up I/O and bus, true-color and 32-bit Ethernet networking add up to the fastest Mac ever—the Quadra.

Apple's Casanova claims the Quadra is "all Mac," but not an extension of the Mac II line.

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Compaq's New CEO: A Focus On Price 37

BY BOB FRANCIS Low-ball prices, mail order distribution, superstores—does this sound like the Compaq Computer Corp. of old? In an interview with DATAMATION, Compaq's new CEO, Eckhard Pfeiffer, maps out the big changes ahead.

X WINDOWS

X Terminal Prices Plunge 41

BY BOB FRANCIS Once linked exclusively to high-end technical shops, X terminals are moving fast into the front office with more low-priced offerings. Step aside, ASCII terminals—this X is meant for you.

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BY TOM McCUSKER Companies are saving money and getting better control by shipping facsimile traffic through LAN servers instead of stand-alone machines.

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QUALITY AND TESTING

Quality Tools for Quality Software 53

BY NED SNELL Which tool to choose for software quality and testing? Users have a wide range of options, from those good old tried and true debuggers to some new, high-powered CASE systems.

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BY JEFF MOAD Networking bottlenecks have throttled the power of UNIX servers when it comes to serving LAN-based PCs. Midrange system makers hope parallel versions of LAN products will overcome this problem.

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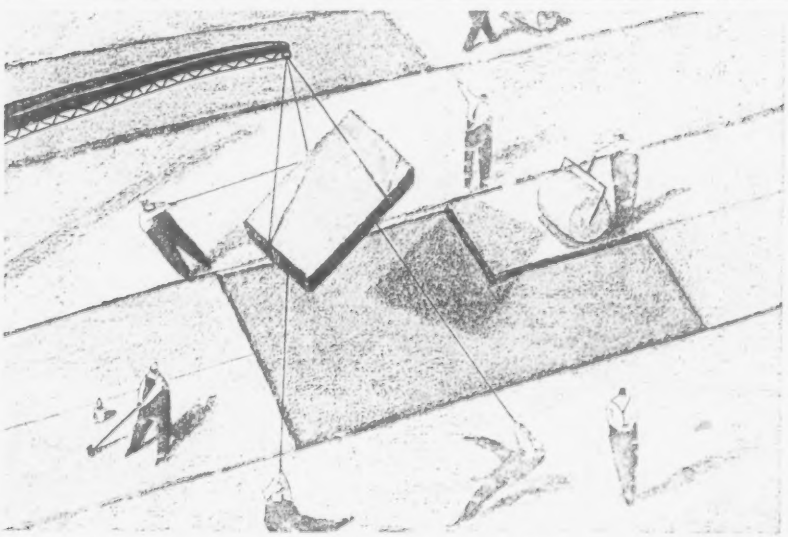

The road to multiprocessing UNIX systems may be paved with NetWare, page 61.

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1992 Industry Outlook

IS departments will run lean and mean in the coming year, their attention focused sharply on making the corporation more competitive.

DATAMATION BRG BUSINESS RESEARCH GROUP POLL

Ladies and gentlemen of the IS industry: there are flickers of light at the end of the proverbial tunnel. While 1991 may be inscribed in the history books as the year of the Big Economic Squeeze, the new year may just witness a heightened sense of purpose among IS professionals about the use of information technology in their organizations and the standing of their shops within their companies.

What seems to be sparking this renewed sense of purpose is that, despite the weak economy, IS managers have decided that they just have to get on with it. Competitiveness must be improved, projects must be done and new technologies must be employed.

This is not to say that tough economic sledding won't continue into 1992. It will. The recovery from last year's recession is occurring at a slower pace than most economists had predicted.

But Cahners Economics, a sister organization of DATAMATION, is forecasting a positive 2.6% growth rate in the Gross National Product (GNP) this year, up from the 0.5% drop of 1991. And, in responses last summer to the DATAMATION/Cowen & Co. survey about IS buying intentions in the year ahead, IS managers indicated a "distinctly positive tilt" in spending plans for 1992.

These developments should be good news for IS managers, whose budgets, while under strong pressure, have held their own for the most part. Evidence of this surfaces in a new poll conducted in late fall by DATAMATION and the Business Research Group, also a sister organization of the magazine. The survey shows a plurality of IS shops, 46% of those polled, expecting spending to remain the same this year as last, a year in which IS budgets grew only 3.4%. Thirty-four percent expect their expenditures to rise this year, and 16% expect to have fewer dollars to play with.

But even if IS managers won't have a lot more cash to spend, they seem focused on what they have to do with the resources at hand. The DATAMATION/BRG poll—which canvassed 150 IS managers, directors and vice presidents—gauged attitudes on key issues.

What emerges from this survey is the conclusion that traditional concerns with the operational efficiencies of IS

What's On The Menu For IS In 1992

DATAMATION/BRG survey shows IS managers rank corporate competitiveness tops.

Source: DATAMATION, Business Research Group

shops have taken a back seat to improving the overall business performance of the company. Three out of the four most critical issues fell into this area. For example, 34% of the IS managers surveyed said using information technology to improve quality in their companies is critically important for 1992. Hard on the heels of this issue (although trailing behind the need to reduce costs) were reshaping business processes through the use of IT and using IT to improve the company's productivity, both checked off by 32.5% of those polled.

But when asked to pinpoint the most important issue they'll be facing in 1992, respondents offer up no clear consensus. At the top of the list is staying within budgets, but this box was checked off by only one in five. Another 14% stressed using IS more productively, and a further 11% felt the key issue is keeping up to date with emerging technologies.

Surprisingly, the much written about phenomenon of downsizing did not score high in the critically important category. Only 15% of those polled said the downsizing of computing resources was critically important in 1992. Twenty-four percent said it was not important at all.

When asked whether their shops had the resources and expertise necessary to do the job in 1992, 76% said they do, and 37% indicated strong agreement. Seventy percent also agreed that they expect to see an improvement in the standing of their organizations in 1992.

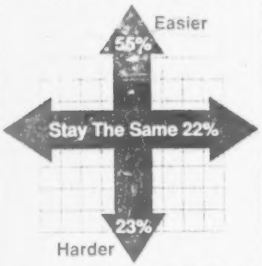
The technologies that will command the most attention this year have been prominent for at least the past couple of years. Local area networks, business applications and integrated network management topped the list of the most important technologies in 1992, with LANs garnering the highest percentage, 32%, of those polled.

In the following pages, DATAMATION's editorial staff reports on how all of the pressures that you're under in your organizations are affecting vendors' plans for new products in 1992. As you will see, vendors are feeling the heat to deliver better price/performance as you become more selective about new technology.

—David R. Brousell

Guarded Optimism About Corporate Budgets

In 1992, do you think it will be easier to get management support for IT activities?

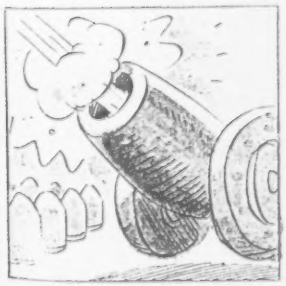


Source: Datamation, BRG

PCs & WORKSTATIONS

The Big Boys Fight Back

As PCs become increasingly commodity-like and ever cheaper, major suppliers are attempting to differentiate their systems by building in more features, placing greater emphasis on software and seeking out new marketing channels.



Witness IBM. After 10 years, Big Blue's share of the PC market was eroded last year by smaller, price-competitive PC manufacturers. "We've been slow in our time to market," admits Paul Mugge, vice president of IBM's Entry Systems Division. That's changing, he says, and IBM's PS/2 line should be evidence of that change this year. Its modular design will allow IBM to quickly launch new versions of these machines, incorporating the fastest processors and memory chips as they become available. IBM is also expected to aggressively roll out new portables this year, from laptops to pen-based systems, starting in Japan and spreading to the United States.

At Compaq Computer Corp. expect to see more entry-level products. "We have focused on the high end of the market, and that doesn't work in this price-conscious market," says Eckhard Pfeiffer, Compaq's new president and chief executive officer. (See article "Compaq's New CEO: A Focus On Price.") Also expect Compaq to introduce products more quickly than before. New color notebooks could be out by the end of the first quarter.

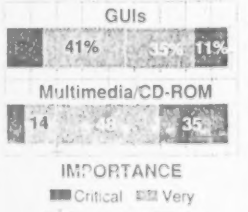
Robert Frankenburg, vice president and general manager of Hewlett-Packard Co.'s Personal Information Products Group, admits that "the desktop business is tough," but says HP will emphasize new network-aware PCs and more capable servers. The firm will also concentrate on delivering more open system UNIX software, taking advantage of the Object Request Broker specification that allows distributed applications to interoperate across different vendors' hardware, beginning with UNIX systems.

Digital Equipment Corp., which doubled its PC business in 1991 while playing catch-up with other suppliers, is more bullish on all of its desktop products. "I think we're in line for very solid growth this year," says Bradley Allen, Digital's manager of shareholder relations. Digital looks particularly to its high-end PCs, with built-in networking and large screens, to satisfy customer demand for PCs with workstation-like performance.

After an unprecedented year of new product introductions, Apple Computer Inc. is "going to keep the ball rolling even faster," says Bob Puette, president of Apple U.S.A. Division. A lower weight PowerBook notebook could be on

Graphics Not Totally In The Picture

Graphical interfaces ranked as important, but not critical, in the DATAMATION/BRG survey. Multimedia is still on the back burner.



Source: Datamation, BRG

Illustrations by Dan Vasconcelos

You could very quickly see Solaris becoming the dominant force in general purpose use on UNIX PCs.

the way by the middle of 1992, sources say, and a color version could roll out by the end of the year. Color could also show up on the low-end Macintosh Classic II desktop machine by the end of the year. Several machines based on Motorola Inc.'s 68040 chip will also be delivered this year. Macintosh machines based on the PowerPC RISC chip, however, are not expected until 1993.

A/UX 3.0, an update to Apple's UNIX operating system, is expected to ship in this quarter. It will be the final major upgrade based on AT&T's System V, release 2.2 of UNIX. The Apple/IBM agreement will send Apple users down the AIX path, probably with release A/UX 4.0. That should allow workstations with RS/6000 and PowerPC processors to run Apple applications. But A/UX 4.0 is not expected until 1993 at the earliest.

We have focused on the high end of the market, and that doesn't work in this price-conscious market.

The Workstation Wars

Sun Microsystems Inc. hopes to continue fueling its growth through evolutionary extensions to existing products. For example, Sun is likely to introduce multiple processor versions of its workstations this year (the first MP servers were announced last fall), and also build multimedia features into the motherboard of all desktop systems. The Solaris 2.0 operating system should be ported to the Intel architecture by the second quarter of this year. "You could very quickly see Solaris becoming the dominant force in general purpose productivity use on [UNIX] PCs," says Alex Osadzinski, director of business development at Sun Microsystems Laboratories.

William J. Filip, president of IBM's Advanced Workstation division, says he doesn't plan to let IBM's workstation momentum slip. After some delays, an under-$10,000 RISC workstation should be announced in the first quarter of this year. Says Lester Marcus, president of the New York/New Jersey AIX Users Group, "There are plenty of users who want a lower end machine to work with."

Besides the low-end RS/6000 unit, IBM is also expected to release some symmetric-multiprocessing hardware this year. To that end, the company has already released software that allows processors to work together, says Phil Hester, vice president, systems and technology, for IBM's Advanced Workstation Division in Austin, Texas. IBM is also working on its own distributed database, but it's unclear when the company might release it as a new product.

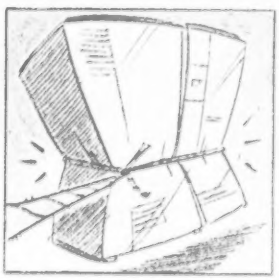
—Paul Pinella and Bob Francis

SYSTEMS

Tight Money For Big Iron

"The days of top management automatically approving data-processing spending have ended."

So says Ben Parke, president of Guidance For Users of Integrated Data-Processing Equipment Inc., or GUIDE, the IBM user group. And vendors are attempting to respond by making strides in price/performance ratios.



The mood of upper management at vendor companies is cautious; no one is inclined to forecast the end of the recession anytime soon. They're all too aware that many IT managers have reacted to the recession by postponing system purchase decisions. Now, says Robert J. LaBant, general manager of IBM's Application Business Systems division, who is responsible for the AS/400, "The question is: Are they going to make the [purchasing] decisions" or keep postponing them?

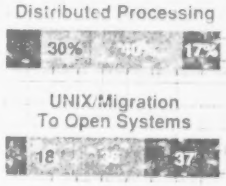
The stagnant economy notwithstanding, most vendors expect some upturn in their businesses, albeit slow. Midrange and peripherals vendors are depending upon new product introductions to shore up the bottom line. Mainframe suppliers, including plug-compatible vendors Amdahl Corp. and Hitachi Data Systems Corp., should benefit as the transition that IBM began in September 1990 with the introduction of the ES/9000 nears completion.

At the midrange level, customers will require both more capacity and better links into enterprisewide networks, LaBant predicts. Expect to see improved interoperability between the AS/400 and PCs, and more. And expect the AS/400 to move up the performance curve.

On the mainframe side, IBM expects customers to demand larger mainframes to take care of consolidation and process reengineering. Marty Clague, assistant general manager for marketing of enterprise systems, says users' consolidation, process-reengineering and downsizing needs are boosting overall mainframe capacity to a 25% annual growth rate. Look for larger mainframes and new ways to interoperate mainframes with PC LANs, says Clague.

No Rush To Open Systems

Implementation of distributed processing, UNIX and open systems are not critical to IS managers for 1992.



Source: Datamation, BRG

Unisys: Here To Stay?

At Unisys Corp., the mainframe company is attempting to stanch the red ink.

"The big question you read in the papers is: Are

they going to make it?" acknowledges Unisys president Reto Braun. "The answer is yes."

Braun says Unisys will have to continue to shed businesses and employees to cut debt further. The goal is a 20% debt-to-equity ratio by the end of 1993—down from 64% in late 1991.

Unisys's strategy is based on selling new products, upgrades and value-added services such as consulting and systems integration to existing customers. Unisys in October introduced a major upgrade to its 2200 mainframe line, the model 900, which includes many features so far only promised by competitors like IBM. Plans are to grow the 2200 even further, eventually to a 128-processor complex.

Midrange Battle

As Hewlett-Packard officials see it, downsizing and a pallid economy are leading IS managers to seek out one attribute: computing value.

If 1991 was HP's Year Of The Workstation, 1992 should be HP's Year Of The Multiuser computer. The company will significantly boost the performance of its base RISC processor technology and combine those new chips into larger, mainframe-class multiprocessor systems that run HP's MPE XL operating system. That means HP will be able to offer mainframe power for a quarter to a third the price of IBM mainframe MIPS, says Lewis E. Platt, HP's executive vice president for computer systems.

HP customers have ambivalent feelings about HP's drive toward open systems. Jane Copeland, chairwoman of HP user group Interex Inc., says users are concerned that they may be pushed into a premature transition to UNIX. "They know it's not an overnight task. And they're just not clear on how it can be accomplished," says Copeland.

HP may have a midrange systems battle on its hands with Digital Equipment, which last October introduced new VAX/VMS 4000 and 6000 midrange systems. The VAX 4000 model 500 achieved a dollar-per-transaction-per-second rating of $11,945—the best price per transaction to date in midranges.

NCR's New Economies

NCR Corp. is betting that customers are making "a fundamental transition to open systems," says chairman and CEO Gilbert P. Williamson. With its Intel microprocessor-based System 3000 family of computers, NCR is attempting to take advantage of the fact that "basic economies of standard microprocessors are competing with those of old mainframe electronics," he says.

NCR plans to make product announcements in virtually every category during 1992, Williamson says. These new releases are intended to combine the best aspects of NCR's current products with those of its new parent corporation, AT&T. NCR will continue to sell and support a number of AT&T products, but its goal is to gradually shift all users to System 3000 solutions. Expect NCR's top-of-the-line, massively parallel System 3700 by the end of the year; also expect to see release 2 of NCR's Cooperation office automation software during the second quarter.

—Jeff Moad, Dwight Davis and Elaine Appleton

SOFTWARE

PC, Mainframe Join Hands

"There's more change going on in the software industry today than I've seen in my entire experience in the business over the past 20 years," says John Landry, chief technology officer for Lotus Development Corp.

Landry says dramatic changes in computer hardware technology are forcing the industry's two independent camps—large-system enterprise software companies such as D&B and Computer Associates International Inc., and small-system LAN-PC software vendors like Borland International Inc., Lotus Development Corp. and Microsoft Corp.—to begin to join forces.

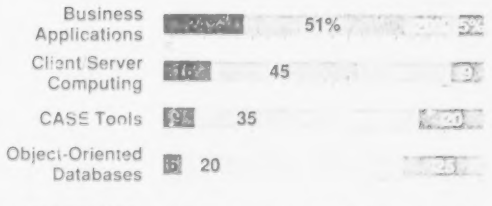
The reason: three technologies critical to successful enterprise computing have become commercially viable PC products. These technologies—graphical user interfaces, LAN systems and PC-LAN-based database management systems—are finally letting desktop computers compete technically with enterprise database management systems, but at a much lower cost.

Computer Associates has made a renewed commitment to competing aggressively in the desktop market. Chairman and CEO Charles Wang says that his long-term goal is to have PC-related business represent 25% of CA's business overall, with mainframe, UNIX and other software constituting the remaining three-quarters. Personal computer software, which Computer Associates has been selling since the early 1980s, currently represents 10 to 15% of the company's overall business, which totaled $1.3 billion in calendar 1990.

Lotus president Jim Manzi expects "double-digit

What's Hot In Software

Business applications and client/server computing are priorities for 1992 in the DATAMATION/BRG survey



Source: Datamation, BRG

Make sure that each step fits in a direction you won't have to retrace in a year or two.

revenue growth in 1992," in great part thanks to increases in sales of Notes and cc:Mail. "We have several large Notes orders pending and expect our joint sales and marketing agreement with IBM to drive significant sales in '92."

Werner Frank, executive vice president of systems software vendor Sterling Software Inc. agrees with the trends mentioned by Lotus's Landry.: "There are some very dramatic changes going on outside our traditional area of MVS and VSE" IBM mainframe systems applications. "The most important for us in the future will be in the mixed LAN environments of DOS and OS/2, perhaps in UNIX," he says.

Stepping Into PC LANs

Other veteran mainframe software companies—including Legent Corp. and Software AG—are also making major efforts to redirect product development to the PC-LAN arena.

Says John F. Burton, Legent's president and chief operating officer: "We've stepped into client/server technologies whole hog; we have all three of our development labs now working on PC products." Burton says 1992 will be the year when the company finally can ship a wide range of PC versions of its previously mainframe-based system management software. Legent saw revenue growth of 20% in 1991 as a result of several new product announcements, despite a brief pause in growth in the second and third quarters. This year, Burton expects sales to increase by 25%.

Worldwide large-systems vendor Software AG has also made a strong commitment to moving all of its products to smaller systems and PC LANs. The company has an overall product direction—dubbed the Entire Function Server—by which all of its products are meant to communicate with other vendors' software products across several platforms and communications systems on networks.

President and CEO Mike King expects Software AG's 1992 sales growth to replicate 1991's 15 to 20% rate. He believes cost pressures on users will continue to force them to look more seriously at implementing smaller systems. But he cautions users to go slow in making cost reduction decisions. "If I were advising users," he says, "I'd tell them: let's take it one tangible step at a time. Make sure that each step fits in a direction you won't have to retrace in a year or two. Stick to the existing or emerging standards, to be on the safe side."

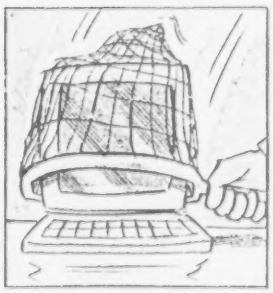
—Bill Semich and Lee Thé

NETWORKS

IS Casts A Bigger Net

"People talked for a long time about the year of the LAN. Now we look back, and it happened," says B.D. Johnson, vice president of product marketing at Banyan Systems Inc.

And most networking vendors expect it to keep happening. Network expansion and development is high on many corporations' lists of IT tasks to accomplish for the next several years. John Edwards, director of marketing for LAN leader Novell Inc., says he agrees with many analysts who expect LAN vendors to grow 20 to 30% annually. Novell will do better than that in the coming year, as revenues swell as much as 40% from the acquisition of Digital Research Inc. But, generally, the firm is on a 30% track for the near future.



Along with a tilt toward more critical apps on networks comes a need for more sophisticated network management. Multivendor management will get a lot of attention from network software vendors in 1992, with emphasis both on standards—notably, the Simple Network Management Protocol (SNMP)—and on integration of smaller networks into larger, corporatewide networks.

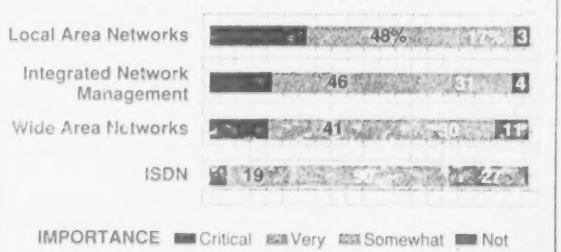
Novell will be rolling out software to link its management applications to IBM's NetView network management product. That will enable users to completely centralize network management or to take advantage of both centralized (NetView) and distributed net management. The October 1991 agreement between Novell and Eastman Kodak Co. making NetWare more image-capable should bear fruit in 1992.

As for NetWare itself, 1992 will be a big year. Version 3.2 should be out in the second half, bringing NetWare to the OS/2 environment. An OS/2 2.0 requestor will be shipped earlier, when IBM ships the production version of the OS/2 2.0 operating system. And further cementing the Big Blue relationship, Novell will ship NetWare for AIX next year.

The trend toward larger, more enterprisewide

What's Hot In Networking

The DATAMATION/BRG survey indicates IS managers pressing ahead with LANs in 1992.



Source: Datamation, BRG

Multivendor management will get a lot of attention from network software vendors in 1992.

networks could help firms like Banyan. An alliance with The Santa Cruz Operation Inc. will mean that Banyan's VINES will be able to run on SCO UNIX System V release 4 for Intel-based servers, broadening Banyan's standards base. Johnson sees open UNIX as the foundation for several new products in 1992.

In 1992, one of Banyan's big projects will be to commercialize its version of the Open Software Foundation's Distributed Management Environment (DCE).

> Customers don't know what to do with 44.7 megabits per second of bandwidth yet.

The LAN explosion is spreading out over the wide area network, increasing WAN traffic from LAN interconnections, says John Petrillo, vice president for business communications services at AT&T. AT&T also sees a lot of growth in wide area e-mail traffic. Certain industries, such as insurance, are doing a lot more on-line transactions between branch and back office systems. But those who expected to see WANs gobbling up T3 circuits will be disappointed. T3 is not burgeoning, Petrillo says. "Customers don't know what to do" with 44.7 megabits per second of bandwidth yet.

Petrillo sees customization as the key to satisfying corporate data network needs. "Most private nets today are a commingling of private lines and frame relay and packet services," he points out. AT&T will deliver 64 high-speed packet services over private lines in the first half of 1992, using frame relay access at 56 kilobits per second and up. Customers will then have multiple frame relay options, both public switched and private, for digital networking.

Growth In Digital Nets

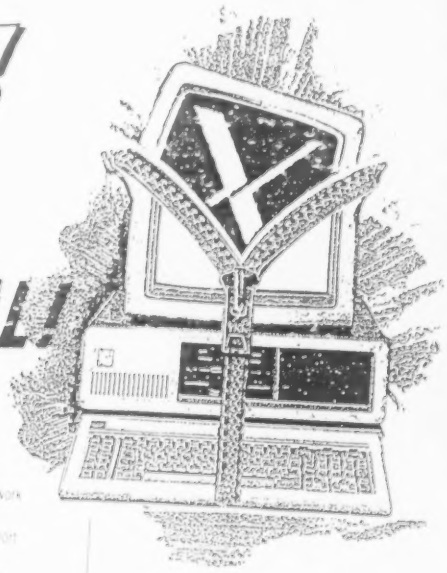
George Grumbles, president of UDS-Motorola, also sees growth in digital networking equipment. He says the company will continue to emphasize digital products. Revenue from digital products represents 15 to 20% of UDS's revenue base, compared with zero a half-dozen years ago.

T1 growth notwithstanding, analog transmission isn't dead. Look for UDS to introduce a V.Fast (24,000bps) modem in 1992, "which may or may not be the last analog frontier," says Grumbles. "It's going to be a very technologically driven product."

Per Suneby, director of business development with Motorola Codex, already sees an uptick in the market for WAN equipment. Suneby thinks that "1992 will be a real year for frame relay services. Frame relay will arrive in real terms." Codex will be part of that trend, introducing more frame relay capabilities for its products in 1992.

—Tom McCusker and Mark Schlack

FANTASTIC!
PC Transformed Into X TERMINAL!



A PC has been discovered leading a double life as an X terminal. By all outward appearances, the PC seemed to be a standalone device, but further examination revealed that a software product called X-One transformed the plain 386 into a powerful X terminal.

X-One 386™ Features
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EUROPE

The Great OSI In The Sky

Can your company wait for the promised land of Open Systems Interconnection, or will you actually have more flexibility by sticking with a more proprietary approach?

BY FRED GUTERL

It's been in the works since 1977. A first draft was produced the following year. But not until 1984 did it attain the status of an international standard, and not for two more years were any products available. Now, 15 years after its conception, Open Systems Interconnection—the idea of exchanging data between a host of dissimilar computers in a multivendor environment—remains as much a promise as a reality.

By now, it's an old, old story. Many—but not all—of the standards have been established that make up the seven-layer OSI Reference Model. Many—but not nearly enough—products have come on the market that would make the standards a reality. And, of course, alternatives more tried and true exist for those who have to get their work done today.

There's no denying that IBM's Systems Network Architecture (SNA), which predates OSI, is here now and is well-established and robust, if proprietary. And the Transmission Control Protocol/Internet Protocol (TCP/IP) UNIX standard has taken root as a popular alternative to OSI's middle network and transport layers, layers 3 and 4.

Why OSI?

Nevertheless, vendors and users agree that OSI will be the way to go in the long run. And the benefits then should be legion—the widest possible choice of hardware, software and applications; the ability to link diverse, already existing systems together into a seamless whole; freedom from the grip of a single vendor's products, prices and architectural whims.

So the question is, are the benefits so great that they're worth the wait? And what are the costs in the meantime?

Hoechst AG, the German steel company based in Frankfurt is moving toward a complete and comprehensive commitment to open systems. Six years ago, Hoechst initiated a plan to move its entire computing operations to open systems as quickly as possible by restricting all network purchases to OSI products. Since the decision came from top management, IT managers at the company enjoy "the freedom to invest in what we think is right in the long run," says head of networking Harald Nottebohm.

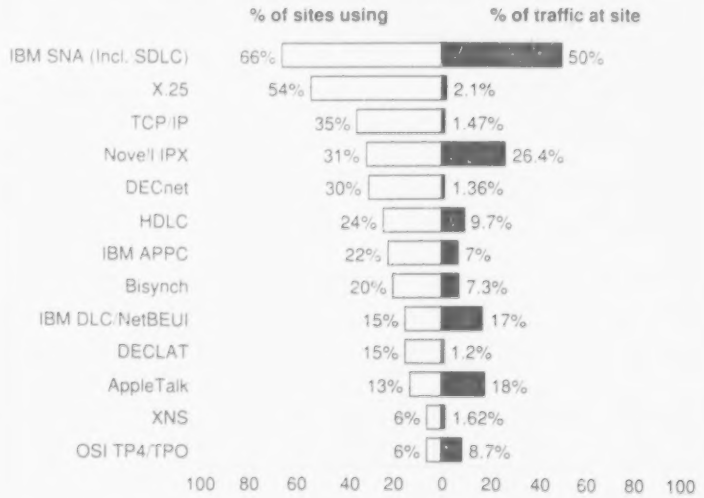
Despite this solid corporate backing, the process of converting from closed to open systems has been laborious. Before deciding to go with open systems, Hoechst had invested hundreds of millions of deutsche marks in seven different computing architectures—one each from Digital Equipment Corp., IBM, Hewlett-Packard Co., NV Philips' GL and Siemens Nixdorf Informationssysteme AG, as well as two from Unisys Corp. The option of throwing any of it out and starting again with compatible systems was untenable. The expense aside, Hoechst could not even begin to muster the expertise needed to redesign so vast a network, says Nottebohm. In addition, the company needed time to nurture crucial experience among its staff in dealing with OSI standards and in de facto open standards like UNIX. So, slowly over the six years, Hoechst has been buying only hardware and software that conforms to OSI standards with the aim of eventually getting all of its existing systems to interoperate through the OSI model.

Nottebohm admits the policy causes delays in deploying new computers in the organization; sometimes he has to search far and wide for an OSI version of a

Protocol Popularity Poll

OSI, and the X.25 and TP4/TPO protocols that run on it, might be in European users' thoughts, but SNA is on their networks, as results from a recent survey of 500 European IS execs show.

TYPES OF NETWORK PROTOCOLS CURRENTLY IN USE ON DEPARTMENT OR CORPORATE NETWORKS



Source: Business Research Group

needed network element. This problem occurs particularly when vendors fail to fulfill their promises to deliver open systems products on time or, more often, when the company's experts are forced to grapple with unfamiliar problems.

Hoechst is only now beginning to reap the benefits of its OSI investments. In the next few years, Nottebohm expects to see a reduction in the high cost of maintaining various architectures as more and more of the networking conforms to OSI standards. At that point, his dependence on gateways to achieve multivendor interoperability should decrease. A recent Frankfurt University study estimated that Hoechst spends DM500,000 each year on gateways to link its various architectures. (IBM's gateways, Nottebohm says, are the most expensive.)

Nottebohm fumes over computer vendors' reluctance to wean customers from proprietary products. "OSI is going to happen, but it could be happening much faster. The vendors spend too many resources on proprietary systems to lock in customers. And users expend too much energy in overcoming these same barriers."

IBM, which has more than 500 engineers at its Rome laboratories doing nothing but developing OSI products, nevertheless defends its proprietary approaches. Big Blue argues that OSI-compliant networks will never provide the depth of functionality that proprietary architectures do. "If we want to change SNA to suit our customers' needs, we can do it more effectively because we don't have to consult a committee," says John Gallop, director of systems network operations at IBM in La Gaude, France.

I cannot afford to be a purist. I wouldn't be around two years from now.

Can't Wait

This is an argument that carries weight with Peter Entwistle, assistant general manager at Lloyds's Bank in London. Information technology is so important to his firm's competitive edge, says Entwistle, that to delay implementing the best solution for the sake of open systems is unthinkable. "If my business clients [within Lloyds] need something to meet their business goals, I cannot afford to be a purist," he says. "I wouldn't be around two years from now."

Half of Lloyds's network, which links the firm's branches throughout Britain, is based on IBM mainframes and SNA, the rest on a mix of primarily proprietary products from other vendors. Still, connectivity is not as difficult an issue for Lloyds as it is for the many European companies that have had to meld totally separate systems acquired through mergers and acquisitions. What matters most to Entwistle in managing his single enterprise network is having a wide choice in selecting suppliers.

Ironically, that's led Lloyds to favor proprietary solutions. Many vendors supply equipment for IBM's SNA or manufacture clones of IBM mainframes. Hastily adopting OSI standards would in some cases actually reduce choice, Entwistle argues. For instance, vendors vary so widely in their implementation of X.25 protocols, which are part of the OSI model for linking data terminals to packet-switched networks, that adopting them would lock him into a single vendor even more than would sticking with SNA.

Entwistle does not completely discount the open systems idea and admits to be gently edging the company in that direction for the long term. But he is deeply skeptical of the promises being made at present. "You won't find me making religious statements," he says. "I don't see the great utopia where one can connect anything to anything else."

Many users are looking to OSI standards not so much to get their various computer products to communicate with each other as to make it easier to port applications from one machine to another. Peter Clotten, vice president for information technology at the German chemical firm Wacker-Chemie AG of Munich, is set on replacing his firm's MS-DOS and OS/2 workstations with OSI-compliant UNIX workstations. "I really need open systems so we can take applications from one workstation to another," he says. However, he has decided to wait until sufficient administrative applications are available for UNIX. And he expects he'll have to wait another three years. "Then we will make a smooth transition," he says.

At the large-system level, Clotten is currently satisfied with relying primarily on IBM 3090 mainframes. However, when the machines begin to become obsolete in another five to seven years, he would like to strip them of their applications software and move those functions down to UNIX systems. Instead, he suspects, mainframes will serve as repositories for corporate data for a long time to come.

What Your Colleagues Are Doing

Few would doubt that Europeans are among the strongest supporters of the Open Systems Interconnection model for multivendor connectivity. But a new survey of over 500 IS executives in seven European countries shows IBM's Systems Network Architecture still firmly entrenched in the enterprise networks.

The survey, conducted by the Newton, Mass.-based Business Research Group, a sister organization of DATAMATION, shows that fully 75% of respondents have enterprise networks in place. Of that group, 66% not only currently use, but have standardized on, SNA network protocols, which account for 50% of all traffic.

The OSI-approved X.25 protocol is a standard on 54% of respondents' networks, but carries only 2.1% of all traffic. And although respondents are using the Transmission Control Protocol/Internet Protocol (TCP/IP) in 35% of their enterprise networks, that alternative to OSI's transport and network standards accounts for a mere 1.47% of traffic at those sites. Contrary to many analysts' expectations, only 12% of respondents are implementing TCP/IP as a migration strategy to OSI, the same percentage that have standardized on TCP/IP as a LAN operating system.

Still, support for OSI is out there: 51% of respondents say OSI solutions are more important than non-OSI solutions in enterprise computing. But the fact that network security and fast-changing technology top the list of problems that these respondents have in integrating their networks and systems may hint at a level of exasperation with the current state of the open systems concept.

—Andrea Ovans

For more information on the BRG report, "Network Integration Europe: User Trends," call Nancy Finn at (617)-964-6204, send her a fax at (617)-558-4402 or write to her at the Business Research Group, 275 Washington Street, Newton, MA 02158 U.S.A.

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